AmericasBarometer, 2014

Sample Design

The 2014 AmericasBarometer study is based on interviews with 53,566 respondents in 28 countries. Nationally representative surveys of voting age adults were conducted in all major languages, using face-to-face interviews in Latin America and the Caribbean and web surveys in the United States and Canada. Samples in each country were developed using a multi-stage probabilistic design (with quotas at the household level for most countries), and were stratified by major regions of the country, size of municipality and by urban and rural areas within municipalities.

Table 1: Sample sizes and Sampling errors in the 2014 AmericasBarometer

Country	Sample Size	Sampling Error
Mexico/ Central America		
Mexico	1,578	±2.5%
Guatemala	1,506	±2.5%
El Salvador	1,512	±2.5%
Honduras	1,561	±2.4%
Nicaragua	1,547	±2.4%
Costa Rica	1,541	±2.5%
Panama	1,508	±2.4%
Andean/Southern Cone		
Colombia	1,512	±2.5%
Ecuador	1,512	±2.5%
Peru	1,500	±2.5%
Bolivia	3,068	±1.8%
Paraguay	1,515	±2.5%
Chile	1,571	±2.5%
Uruguay	1,512	±2.5%
Brazil	1,500	±2.5%

Venezuela	1,500	±2.5%
Argentina	1,512	±2.5%
Caribbean		
Bahamas	3,429	±1.8%
Barbados	3,828	±1.8%
Belize	1,534	±2.5%
Dominican Republic	1,520	±2.5%
Guyana	1,558	±2.5%
Haiti	1,512	±2.3%
Jamaica	1,506	±2.5%
Suriname	4,000	±1.6%
Trinidad & Tobago	4,207	±1.6%
United States and Canada		
Canada	1,517	±2.5%
United States	1,500	±2.5%
Total	**53,566**	

*Confidence intervals based on unweighted sample sizes. For cross-national analysis purposes, LAPOP weights each sample to 1,500. These sampling errors are based on SRS and not adjusted for stratification and clustering. For information on the impact of the complex sample design on confidence intervals, see section VII of this document.

In its effort to collect the best quality data possible and therefore produce the highest quality studies, the Latin American Public Opinion Project (LAPOP) adopted a new sample design for the AmericasBarometer 2012 round of surveys, which was also employed in 2014. The two main reasons for this decision to change the sample design from that which was used in the 2004-2010 period were: (1) updating the sample designs to reflect the population changes as revealed by recent census information, and (2) standardizing the sample sizes at the level of the municipality in order to both reduce the variance and provide a basis for using multi-level analysis drawing on municipal data. This change in the sample design makes the sample representative by municipality type[1], to enable the use of the municipality as a unit of analysis for multilevel statistical analysis. Details of the revisions are found in the description of the 2012 AmericasBarometer surveys.

In 2013 LAPOP entered into a Memorandum of Understanding (MOU) with the Institute for Social Research at the University of Michigan for assistance in and advice on the AmericasBarometer. One of the world's leading experts in sample design methodology, Dr. Jim Lepkowski, and his graduate students, advised us throughout the process. Over the course of a year we worked with Dr. Lepkowski and his team of graduate students to review each previously developed sample design and to secure their input and advice on new designs. Our colleagues at

[1] The new sample design included three different strata of municipalities classified according to their size. Municipalities were grouped in sizes appropriate for the country. One common grouping was (1) Municipalities with less than 25,000 inhabitants, (2) Municipalities with between 25,000 and 100,000 inhabitants, (3) Municipalities with more than 100,000 inhabitants.

the University of Michigan, confirmed that LAPOP had already been following the best practices, within the limits of resources at our disposal, in its sample design. Our own review of the major update we carried out in 2012 sample design left us pleased in almost every respect. The effort to obtain a standard sample size per municipality/canton/parish did not have any adverse impact on intra-class correlation levels, yet has given us a basis for calculating context effects at the local level. In some particular cases, however, in the 2014 round we requested country teams to conduct specific alterations, like updating their sampling frame to take into consideration (if available) the new 2010-2011 national census information. We also asked teams to verify that the 2012 sample design continues to reflect and represent each country population structure and distribution.

Finally, after several rounds of consultations and technical discussions with experts at the ISR at the University of Michigan on how to update the 2012 samples for the 2014 round of surveys, LAPOP requested that countries to update their samples at the block level while retaining the same primary and sub-stratification units (i.e., *Estratopri, Municipalities and Census Segments)* that were included in the 2012 sample. This means that users of prior AmericasBarometer surveys can do so knowing that the designs across time remain very similar, if not identical. Countries that had new population census available and did not experience significant population shifts or changes in their population distribution were asked to replicate the 2012 sample using the latest census information available and to replace the sampling points at the block level.

With respect to *data collection*, in the 2014 round of the AmericasBarometer we expanded the use of handheld electronic devices. For the first time, we employed for data collection the "Adgys"© questionnaire app designed by our partners in Cochabamba, Bolivia. The use of electronic devices for interviews and data entry in the field reduces data entry errors, supports the use of multiple languages, and permits LAPOP to track on a daily basis the progress of the survey, down to the location of interviews (which are monitored in real time, or nearly real time, but not recorded into the public datasets in order to preserve respondents' privacy) and the timing of the interviews. The team in Bolivia worked long hours to program the samples and questionnaires into the Adgys platform for the 20 countries in which we used this technology. In the remaining 6 countries we continued our use of PDAs and a Windows Mobile-based software application supported by our hardworking partners at the University of Costa Rica.

The remaining pages of this technical note describe the sample design of the AmericasBarometer 2014 survey.

I. Universe, Population, Unit of Observation

Universe: The surveys provide national coverage of voting age adults. The universe is comprised of the population living in urban and rural areas and it is representative at the national and regional level.

Population: The survey is designed to collect information from a nationally representative sample of the entire voting age population. Only non-institutionalized voting age adults are eligible to participate in the survey. Therefore, the sample excludes people in boarding schools, hospitals, police academies, military barracks, and inmates of the country's jails.

Unit of Observation: Only one respondent is interviewed per household. The questionnaire almost exclusively includes topics focused on that single respondent, but also does include some questions related to other members of the household and the condition of the household itself. Thus, the statistical unit of observation is the household. However, some respondents live in dwellings that are shared with other households. For this reason, it is more appropriate to consider the dwelling as the final unit of analysis. Additionally, the dwelling is an easily identifiable unit in the field, with relative permanence over time, a characteristic that allows it to be considered as the final unit of selection.

II. Sample frame

The sampling frame covers 100% of the eligible voting age population in the surveyed country. This means that every eligible person in the country has an equal and known chance of being included in the survey sample. It also means that no particular ethnic group or geographical areas are excluded from the sampling frame unless the country sample design indicates otherwise. For example, certain Island areas and territories might be excluded. See the country study sample descriptions for such exceptions.

III. Sampling Method

The sampling method chosen takes into consideration a series of elements pre-established by LAPOP.

On the basis of these requirements, the method that is used corresponds to a **stratified multi-stage cluster sampling.** The sample is stratified based on three factors:

1) Size of the Municipalities
2) Urban/Rural areas
3) Regions

The stratified sampling ensures a greater reliability in our sample by reducing the variance of the estimates. Stratification improves the quality of estimates, with the sole condition that the whole sample unit belongs to only one stratum, and the strata in combination cover the total population. Stratification also enables us to ensure the inclusion in the sample of the most important geographic regions in the country while requiring geographic sample dispersion.

IV. Stratification

Stratification is the process by which the population is divided into subgroups. Sampling is then conducted separately in each subgroup. Stratification allows subgroups of interest to be included in the sample whereas in a non-stratified sample some key subgroups may have been left out due to the random nature of the selection process. In an extreme case, samples that are not stratified can, by chance, exclude the nation's capital or largest city. Stratification helps us increase the precision of the sample. It reduces the sampling error. In a stratified sample, the sampling error depends on population variance within strata and not between them.

V. Weighting of individual country datasets

Most of the 2014 AmericasBarometer samples are self-weighted except for Bahamas Bolivia, Chile, Trinidad & Tobago, Suriname, United State and Canada. Each country data set contains a variable called WT which is the "country weight" variable. In countries in which the sample is self-weighted, the value of each case = 1. In addition, in order to give each country in the study an identical weight in the pooled sample, LAPOP reweights each country data set in the merged files so that each country has an N of 1,500. The variable "WEIGHT1500" should be activated to produce representative national results. In SPSS this is done via the "weight" command.

VI. Fieldwork dates

Fieldwork dates for each country for the 2014 round are reported in Table 2.

Table 2: Fieldwork dates by country, 2014 AmericasBarometer

Country	Fieldwork start date	Fieldwork end date
Mexico/ Central America		
Mexico	January 24th	February 24th
Guatemala	April 1st	May 10th
El Salvador	March 28th	April 30th
Honduras	March 18th	May 9th
Nicaragua	February 25th	March 22nd
Costa Rica	March 4th	May 6th
Panama	March 13th	May 3rd
Andean/Southern Cone		
Colombia	March 28th	May 5th
Ecuador	January 21st	February 15th
Peru	January 23rd	February 8th
Bolivia	March 26th	May 18th
Paraguay	January 18th	February 8th
Chile	April 16th	May 22nd
Uruguay	March 8th	April 23rd
Brazil	March 21st	April 27th
Venezuela	March 24th	April 26th
Argentina	February 28th	March 22nd
Caribbean		
Bahamas	June 17th	October 7th
Barbados	February 27th, 2015	July 27th, 2015
Belize	May 2nd	May 28th
Dominican Republic	March 11th	March 25th
Guyana	June 4th	July 12th
Haiti	February 18th	March 8th

Jamaica	February 25th	March 20th
Suriname	June 21st	August 25th
Trinidad & Tobago	March 15th	June 6th
United States and Canada		
Canada	June 22nd	July 1st
United States	June 26th	July 6th

VII. Design Effects

Accuracy of the Findings

Two types of errors affect all surveys: non-sampling errors and sampling ones. Non-sampling errors are those that are committed during the data collection and processing. These can be controlled using a good measuring instrument, adequately training the surveyors, supervising the fieldwork, and with appropriate data collection programs. These errors can be controlled but not quantified. However, comparing the sample results with those of the population gives us an idea of whether these errors have generated biases that reduce the representativeness of the sample. The use of handheld computers (palm pilots) probably reduced these errors by carrying out consistency checks of the responses and flow of the interview at the same time and place that it was done. Additionally, by eliminating the process of data entry, we eliminated the errors that this activity generates. With the traditional procedures of paper-based questionnaires, processes of coding and critiquing the data must be carried out in the office (eliminated by using palm pilots), which can also generate errors. With paper questionnaires, computer-based consistency checks can only be run several weeks after the data was collected. Correcting errors detected in the office during the critique or by programs that detect inconsistencies is difficult or impossible given the separation in time and space between the moment of the interview on paper and the detection of these errors.

Sampling errors are a product of chance and from surveying a sample and not the entire population. When a sample is selected, this sample is one of many possible samples that could be selected from the population. The variability that exists between all these possible samples is the sampling error, which we could measure if all these samples were available, obviously an impossible situation. In practice, what is done is to estimate this over the variance obtained from the sample itself. To estimate the sampling error of a statistic (average, percentage, or ratio), we calculate the standard error, which is the square root of the population variance of the statistic. This allows us to measure how close the statistic is to the result that would have been obtained if the entire population were interviewed under the same conditions.

$$DEFT = SE_{complex} / SE_{URS}$$

To calculate this error, it is very important to consider the design with which the sample was selected. The design effect (DEFT –above is DEFT) indicates the efficiency of the design used in relation to an unrestricted random sampling design (URS). A value of 1 indicates that the standard error (SE) obtained for both designs (the complex and the URS) is equal; that is, the

complex sampling is as efficient as the URS with the same-sized sample. If the value is greater than 1, the complex sampling produces a SE greater than that obtained with a URS.

Table 3 show the value of the statistic in question (average or percentage) and the design effects (DEFT) of the 2014 round of the AmericasBarometer. The table also reports the design effects of the 2012 round (for the same variables). The SE were estimated with the Stata 12 computational package. Extreme values come from a high degree of homogeneity within each cluster. In other words, in these cases there is an important spatial segregation of people according to their socioeconomic condition, which reduces the efficiency of cluster sampling to measure these characteristics.

It is worth stating that sampling error is usually 10% to 40% greater than that which would have been obtained with unrestricted random sampling. In general for a well design study, the design effect usually ranges from 1 to 3. For example, in the case of Costa Rica, the Support for Democracy (Ing4r) has a sampling error of 1.63. This means that the 95% confidence interval (1.96 times the SE) for the average of this variable (74.19) goes from 72.01 to 76.37. According to the DEFT of the table, this interval is 63% greater than that which would have been obtained with a URS (see Table 3).

Table 3: Design effects, 2014 AmericasBarometer Survey

País	Ing4r				it1r			
	2014			Ronda 2012	2014			Ronda 2012
	Promedio	Error Estandar	DEFT	DEFT	Promedio	Error Estandar	DEFT	DEFT
México	66.41	1.18	1.66	1.33	59.07	1.08	1.55	1.58
Guatemala	67.27	1.05	1.47	1.32	56.89	0.94	1.27	2.83
El Salvador	65.86	0.68	0.99	0.98	62.05	1.05	1.28	1.11
Honduras	65.77	1.06	1.37	1.05	61.33	1.16	1.41	1.71
Nicaragua	68.43	0.74	0.97	1.07	61.50	1.07	1.30	1.13
Costa Rica	74.19	1.11	1.63	1.31	63.47	1.33	1.75	1.87
Panamá	58.87	1.18	1.51	1.37	60.28	1.10	1.56	1.41
Colombia	71.48	1.05	1.46	1.36	63.10	1.23	1.61	1.61
Ecuador	71.31	1.35	1.93	1.23	60.30	1.23	1.62	1.52
Bolivia	67.37	0.71	1.68	1.87	52.80	1.05	2.21	1.93
Peru	62.49	1.16	1.63	1.21	51.06	0.89	1.33	1.63
Paraguay	62.59	0.97	1.08	1.10	70.81	0.90	1.17	1.20
Chile	75.33	1.10	1.81	1.38	67.00	1.38	1.91	1.99
Uruguay	85.08	0.79	1.30	1.15	67.17	1.12	1.54	1.78
Brazil	66.13	1.35	1.69	1.25	52.76	1.12	1.45	1.58
Venezuela	76.13	2.02	2.49	1.35	59.10	1.22	1.68	1.41
Argentina	81.72	0.90	1.33	1.23	64.49	1.22	1.69	1.73
Dominican Rep.	72.58	0.84	1.21	0.96	57.78	0.98	1.28	1.23
Haiti	64.30	1.10	1.49	1.16	47.98	1.53	1.86	1.56
Jamaica	63.84	1.29	1.63	1.29	55.59	1.00	1.36	1.72
Guyana	69.64	1.24	1.54	1.33	63.57	1.11	1.66	2.01
Trinidad and Tobago	74.95	1.16	2.87	1.04	67.03	0.76	2.34	1.05
Belize	71.39	1.18	1.50	1.12	59.46	1.13	1.50	1.52
Bahamas	67.43	0.76	1.71	-	64.34	0.92	1.93	-
Suriname	67.61	0.95	2.04	1.01	67.88	0.78	1.63	1.85
Barbados	67.76	1.18	2.46	-	64.41	0.69	1.79	-
United States	72.59	0.91	1.35	1.03	63.41	0.82	1.38	1.06
Canada	77.72	0.61	1.06	1.03	66.39	0.56	1.09	1.07

Table 3: Design effects, 2014 AmericasBarometer Survey (cont.)

País	corvic				PSA5			
	2014			Ronda 2012	2014			Ronda 2012
	Promedio	Error Estandar	DEFT	DEFT	Promedio	Error Estandar	DEFT	DEFT
México	27.25	1.39	1.24	1.48	52.18	0.90	1.60	1.84
Guatemala	20.66	1.24	1.18	1.20	49.00	0.75	1.45	1.96
El Salvador	9.79	0.80	1.05	1.13	55.26	0.55	1.05	0.99
Honduras	23.00	1.53	1.44	1.46	52.51	0.75	1.38	1.69
Nicaragua	14.74	0.97	1.07	0.94	61.85	0.74	1.29	1.12
Costa Rica	15.52	1.30	1.41	3.29	62.34	0.62	1.28	1.00
Panamá	18.85	1.84	1.83	1.60	52.99	0.89	1.65	1.42
Colombia	13.62	1.25	1.42	1.52	49.47	0.81	1.44	1.55
Ecuador	25.99	1.84	1.62	1.48	59.58	0.86	1.68	1.66
Bolivia	30.21	1.68	2.02	2.98	50.67	0.72	2.26	2.82
Peru	26.40	1.51	1.33	1.19	45.19	0.90	1.76	1.65
Paraguay	28.10	1.50	1.29	1.33	43.03	0.87	1.43	1.22
Chile	5.31	0.90	1.58	1.49	50.53	0.93	1.89	2.28
Uruguay	6.75	0.67	1.04	0.93	58.38	0.68	1.19	1.17
Brazil	13.87	1.38	1.55	1.50	37.61	1.04	1.74	1.74
Venezuela	26.55	1.94	1.70	1.19	42.26	1.25	1.72	1.70
Argentina	16.75	1.45	1.51	1.74	55.33	0.91	1.54	2.09
Dominican Rep.	23.29	1.18	1.08	0.89	49.75	0.74	1.25	1.14
Haiti	69.16	1.74	1.47	1.57	42.34	1.11	2.13	1.97
Jamaica	9.83	0.84	1.09	1.14	42.49	0.63	1.13	1.67
Guyana	15.81	1.19	1.28	1.53	47.07	1.01	1.72	2.33
Trinidad and Tobago	10.21	0.76	1.63	1.26	52.29	1.11	2.92	1.28
Belize	20.53	0.89	0.86	1.08	49.49	0.60	1.05	1.49
Bahamas	18.21	1.14	1.73	-	61.28	0.85	2.19	-
Suriname	7.35	0.50	1.21	1.07	60.73	0.79	2.48	1.24
Barbados	3.90	0.41	1.32	-	54.55	0.78	2.15	-
United States	7.78	1.06	1.54	1.08	49.90	0.79	1.40	1.05
Canada	4.42	0.56	1.05	1.08	60.10	0.57	1.07	1.06

Table 3: Design effects, 2014 AmericasBarometer Survey (cont.)

País	tol				m1r			
	2014			Ronda 2012	2014			Ronda 2012
	Promedio	Error Estandar	DEFT	DEFT	Promedio	Error Estandar	DEFT	DEFT
México	47.68	1.04	1.62	1.96	44.46	0.96	1.44	1.62
Guatemala	29.54	0.75	1.28	2.04	53.77	0.76	1.60	1.52
El Salvador	42.07	0.58	0.98	0.91	67.47	0.52	0.83	1.20
Honduras	43.34	0.82	1.25	1.62	65.90	0.55	1.02	1.37
Nicaragua	46.82	0.94	1.41	0.99	66.68	0.59	1.04	1.15
Costa Rica	47.01	1.26	1.99	1.83	37.00	0.69	1.13	1.16
Panamá	32.09	0.92	1.82	1.89	62.18	0.83	1.46	1.48
Colombia	46.96	0.96	1.41	1.46	50.93	0.80	1.43	1.26
Ecuador	40.89	1.21	1.92	1.88	71.61	0.80	1.45	1.26
Bolivia	40.69	1.04	2.78	2.55	63.12	0.70	1.99	2.67
Peru	42.84	1.05	1.85	1.52	47.69	0.56	1.20	1.43
Paraguay	49.73	1.15	1.57	1.33	55.75	0.89	1.42	1.23
Chile	54.01	1.43	1.94	2.38	60.98	0.95	1.68	2.15
Uruguay	58.66	1.28	1.62	2.09	61.82	0.56	0.93	1.12
Brazil	52.91	1.31	1.89	1.77	52.43	0.96	1.45	1.31
Venezuela	61.80	1.53	2.02	2.54	34.31	1.21	1.54	1.52
Argentina	54.88	1.27	1.65	1.90	46.33	0.90	1.25	1.33
Dominican Rep.	51.13	0.74	1.08	1.38	73.91	0.69	1.34	1.01
Haiti	50.04	0.88	1.76	2.16	68.78	1.05	1.65	1.29
Jamaica	55.40	1.39	2.04	2.14	48.89	1.07	1.47	1.40
Guyana	53.52	1.56	2.24	2.76	50.94	1.35	1.95	2.09
Trinidad and Tobago	60.45	1.29	2.86	1.29	44.26	1.44	3.20	1.41
Belize	49.95	1.04	1.43	1.40	51.17	0.73	1.15	1.20
Bahamas	53.08	1.16	2.56	-	56.48	0.87	1.84	-
Suriname	43.86	0.69	1.73	1.18	65.94	0.63	1.80	1.62
Barbados	52.91	0.98	2.60	-	39.66	1.01	2.31	-
United States	69.94	0.87	1.36	1.05	42.70	1.21	1.34	1.02
Canada	69.29	0.59	1.08	1.06	47.55	0.83	1.09	1.07

For more information on the sample within each country, please see the country reports and technical information sheets on the AmericasBarometer website, **http://www.AmericasBarometer.org**.